Examples of Problem solving and Reasoning activities in Year 4
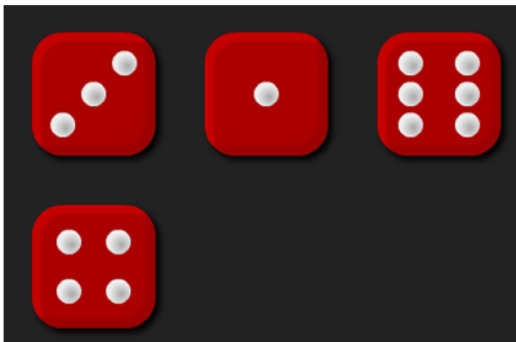
There are four dice, each of them with faces labelled from 1 to 6.
When the dice are rolled they can be combined in twenty four different ways to m
a four-digit number.
For example, if I roll a 1, 2, 3 and 4 I can combine them to make:
1234, 1243, 1324, 1342, 1423, 1432, 2134, 2143, 2314, 2341, 2413, 2431, 312
3142, 3214, 3241, 3412, 3421, 4123, 4132, 4213, 4231, 4312 or 4321.

Now pick four different four-digit numbers from the list and round each of them t
the nearest multiple of 1000. For example, 1324 rounds to 1000, 2314 rounds to
2000, 4312 rounds to 4000 and 4123 rounds to 4000.
Do the four four-digit numbers you choose ever all round to the same multiple of
1000?
Do the four four-digit numbers you choose ever round to unique multiples of 100(

Which questions are easy?
Which questions are hard?

$$8{,}273 + 4 = \underline{\quad}$$

$$8{,}273 + 4 \text{ tens} = \underline{\quad}$$

$$8{,}273 - 500 = \underline{\quad}$$

$$8{,}273 - 5 \text{ thousands} = \underline{\quad}$$

Why are some easier than others?

	H	T	O
	5	?	3
−	2	1	8
	3	1	5

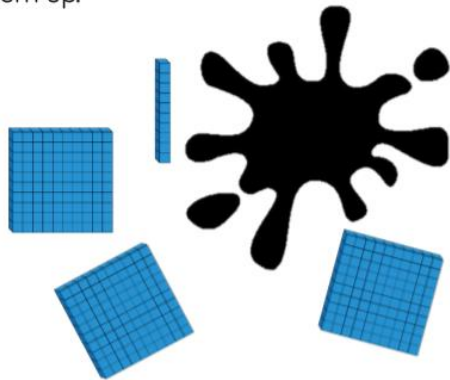|	H	T	O
	?	0	?
−	2	?	8
	2	4	6

Eva is working out $406 - 289$

Here is her working out:

Step 1

$$\begin{array}{c} \overset{3}{\cancel{4}}0\overset{1}{6} \\ -\ 2\ 8\ 9 \\ \hline 7 \end{array}$$

Step 2

$$\begin{array}{c} \overset{2}{\cancel{\overset{3}{\cancel{4}}}}\overset{1}{0}\overset{1}{6} \\ -\ 2\ 8\ 9 \\ \hline 0\ 2\ 7 \end{array}$$

Explain her mistake.

What should the answer be?

Teddy has used Base 10 to represent the number 420. He has covered some of them up.

Work out the amount he has covered up.

How many different ways can you make the missing amount using Base 10?

1 Fill in the missing values.

$$9,523 + 10 = \boxed{}$$

$$\boxed{} + 3,589 = 3,689$$

$$3,891 + \boxed{} = 4,891$$

2 Complete the table.

1,000 less	Number	1,000 more

3 Find 1,000 more and 1,000 less than each number.

5,000	7,500	2,359	8,999

Use concrete resources to prove you are correct.

Use the digit cards to fill in the missing digits.

1	2	3	4	5	6	7	8	9

$$170 \div 10 = \_\,\_$$

$$\_20 \times 10 = 3,\_00$$

$$1,8\_0 \div 10 = 1\_6$$

$$\_9 \times 100 = 5,\_00$$

$$6\_ = 6,400 \div 100$$

1,235 people go on a school trip.

There are 1,179 children and 27 teachers. The rest are parents.

How many parents are there?

Explain your method to a friend.

Find the missing numbers that could go into the spaces.

Give reasons for your answers.

$$\text{\_\_\_\_} - 1{,}345 = 4\_6$$

What is the greatest number that could go in the first space?

What is the smallest?

How many possible answers could you have?

What is the pattern between the numbers?

What method did you use?

Ali and Sarah calculate $420 + 221 + 280$ using different strategies.

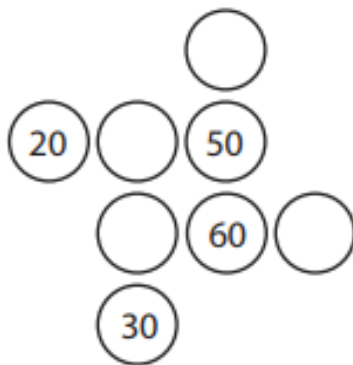| This is Sarah's strategy:	This is Ali's strategy:
$420 + 221 + 280$	$420 + 221 + 280$
$420 + 221 = 641$	$420 + 280 = 700$
$641 + 280 = 921$	$700 + 221 = 921$
Answer $= 921$	Answer $= 921$

Which do you prefer?

Explain your reasoning.

Now calculate $370 + 242 + 130$ using your preferred strategy.

Complete this diagram so that the three numbers in each row and column add up to 140.

(20) ( ) (50)
( ) (60) ( )
(30)

Now create your own diagram with a total of 250.

Fill in the empty boxes to make the equations correct.

| 7 | | 1 | + | | 3 | | = 999 |

| 7 | | 1 | + | | 3 | | = 1000 |

Complete:

$$
\begin{array}{r}
6\ \square\ \square\ 8 \\
+\ \square\ \square\ 8\ \square \\
\hline
9{,}3\ 2\ 5 \\
{\scriptstyle 1\quad 1\quad 1}
\end{array}
$$

Greg says that 'there is more than one answer for the missing numbers in the hundreds column'. Is he correct?
Explain your answer.